

Appl. No. 09/817,932
Amdt. dated March 9, 2005
Reply to Office Action of November 29, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (currently amended). A method for generating a halftone of a source image, the halftone including halftone pixels, the halftone pixels being suitable for containing halftone dots, the method comprising steps of:

(A) selecting glyphs corresponding to regions in the source image, the regions having intensities, the glyphs including halftone dots;

(B) selecting, from among the halftone pixels, a first halftone pixel ~~and a second halftone pixel that share a pixel boundary~~;

(C) selecting a first boundary of the first halftone pixel using a first boundary selection criterion that is dependent on a position of the first halftone pixel and independent of the intensity of the corresponding region;

(D) locating a first one of the halftone dots within the first halftone pixel so that the first halftone dot abuts the first pixel boundary; ~~and~~

(E) selecting, from among the halftone pixels, a second halftone pixel;

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(F) selecting a second boundary of the second halftone pixel using a second boundary selection criterion that is dependent on a position of the second halftone pixel and independent of the intensity of the corresponding region; and

(DG) locating a second one of the halftone dots within the second halftone pixel so that the second halftone dot abuts the second pixel boundary, wherein the first and second pixel boundaries are the same boundary.

Claim 2 (currently amended). The method of claim 1, further comprising a step of:

(EH) rendering the halftone on an output medium using an output device.

Claim 3 (original). The method of claim 2, wherein the output device comprises a thermal printer.

Claim 4 (currently amended). The method of claim 2, wherein the step (EH) comprises a step of:

(EH) (1) rendering the first and second halftone dots as a single contiguous mark.

Claim 5 (currently amended). The method of claim 4, wherein the step (EH) (1) comprises a step of rendering the single contiguous mark using a print head element of a thermal printer.

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Claim 6 (original). The method of claim 1, wherein the source image comprises a digital image including a two-dimensional array of source image pixels, and wherein the regions in the source image comprise the source image pixels.

Claim 7 (original). The method of claim 6, wherein each of the glyphs corresponds to a source image pixel.

Claim 8 (original). The method of claim 1, wherein each of the glyphs comprises a two-dimensional array of halftone pixels.

Claim 9 (original). The method of claim 8, wherein each of the glyphs comprises one halftone pixel.

Claim 10 (original). The method of claim 9, wherein the size of a halftone dot contained within any one of the glyphs is inversely related to the intensity of the source image region that corresponds to the glyph.

Claim 11 (original). The method of claim 1, wherein the first and second halftone dots are selected from one of the glyphs, and wherein the first and second halftone dots are in adjacent pixels within the selected glyph.

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Claim 12 (currently amended). The method of claim 1, wherein the first and second ~~halftone pixels share a pixel boundaries~~y that is are perpendicular to a slow scan direction of an output device on which the halftone may be rendered.

Claim 13 (original). The method of claim 1, wherein each of the halftone pixels has a top boundary and a bottom boundary, and wherein the method further comprises a step of:

(E) positioning a third one of the halftone dots within a third one of the halftone pixels that is adjacent to the first halftone pixel by performing steps of:

- (1) if the first halftone dot abuts the top boundary of the first halftone pixel, positioning the third halftone dot to abut the bottom boundary of the third halftone pixel; and
- (2) if the first halftone dot abuts the bottom boundary of the first halftone pixel, positioning the third halftone dot to abut the top boundary of the third halftone pixel.

Claim 14 (original). The method of claim 13, wherein diagonally opposing corners of halftone pixels

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lie along a line at substantially a 45-degree angle to an axis of the halftone.

Claim 15 (original). The method of claim 13, wherein diagonally opposing corners of halftone pixels lie along a line at substantially a 38-degree angle to an axis of the halftone.

Claim 16 (currently amended). The method of claim 1, wherein the step (A) comprises a steps of:

~~(A) (1) identifying intensities of the regions in the source image; and~~

(A) (2) selecting glyphs corresponding to the identified intensities of the regions in the source image.

Claim 17 (currently amended). The method of claim 16, wherein the step (A) further comprises a steps of:

~~(A) (1) identifying intensities of the regions in the source image;~~

~~(A) (2) selecting glyphs corresponding to the identified intensities;~~

(A) (3) selecting halftone dots from the glyphs based on the coordinates of the source image regions.

Claim 18 (currently amended). The method of claim 1, wherein the first one of the halftone dots is contained within a first pixel of a select one of the glyphs, wherein the second one of the halftone dots is

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contained within a second pixel of the select one of the glyphs, and wherein:

the step (E_D) comprises locating the first one of the halftone dots within the first halftone pixel based on a location of the first one of the halftone dots within the first pixel of the select one of the glyphs; and wherein

the step (E_G) comprises locating the second one of the halftone dots within the second halftone pixel based on a location of the second one of the halftone dots within the second pixel of the select one of the glyphs.

Claim 19 (currently amended). A method for generating a halftone of a digital source image including a two-dimensional array of source image pixels, the halftone including halftone pixels, the halftone pixels being suitable for containing halftone dots, the method comprising steps of:

(A) selecting halftone dots corresponding to source image pixels, the size of each of the halftone dots being inversely related to the intensity of one of the source image pixels;

(B) selecting, from among the halftone pixels, a first halftone pixel ~~and a second halftone pixel that share a pixel boundary that is perpendicular to a slow scan direction of an output device on which the halftone may be rendered;~~

(C) selecting a first boundary of the first halftone pixel using a first boundary selection

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criterion that is dependent on a position of the first halftone pixel and independent of the intensity of the corresponding source image pixel;

(ED) locating a first one of the halftone dots within the first halftone pixel so that the first halftone dot abuts the first pixel boundary;

(E) selecting, from among the halftone pixels, a second halftone pixel;

(F) selecting a second boundary of the second halftone pixel using a second boundary selection criterion that is dependent on a position of the second halftone pixel and independent of the intensity of the corresponding region;

(DG) locating a second one of the halftone dots within the second halftone pixel so that the second halftone dot abuts the second pixel boundary, wherein the first and second pixel boundaries are the same boundary and are perpendicular to a slow scan direction of an output device on which the halftone may be rendered; and

(EH) rendering the halftone on an output medium using a thermal printer, wherein the step of rendering includes a step of rendering the first and second halftone dots as a single contiguous mark.

Claim 20 (currently amended). A method for generating a halftone of a digital source image including a two-dimensional array of source image pixels, the halftone including halftone pixels, the halftone pixels being suitable for containing halftone dots, the method comprising steps of:

(A) identifying intensities of the source image pixels;

(B) selecting glyphs corresponding to the identified intensities, the glyphs including halftone dots;

(C) selecting halftone dots from the glyphs based on the coordinates of the source image pixels;

(D) selecting, from among the halftone pixels, a first halftone pixel ~~and a second halftone pixel that share a pixel boundary that is perpendicular to a slow scan direction of an output device on which the halftone may be rendered;~~

(E) selecting a first boundary of the first halftone pixel using a first boundary selection criterion that is dependent on a position of the first halftone pixel and independent of the intensity of the corresponding source image pixel;

(EF) locating a first one of the halftone dots within the first halftone pixel so that the first halftone dot abuts the first pixel boundary;

(G) selecting, from among the halftone pixels, a second halftone pixel;

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(H) selecting a second boundary of the second halftone pixel using a second boundary selection criterion that is dependent on a position of the second halftone pixel and independent of the intensity of the corresponding source image pixel;

(FI) locating a second one of the halftone dots within the second halftone pixel so that the second halftone dot abuts the second pixel boundary, wherein the first and second pixel boundaries are the same boundary; and

(GJ) rendering the halftone on an output medium using a thermal printer, wherein the step of rendering includes a step of rendering the first and second halftone dots as a single contiguous mark.

Claim 21 (new). A method for generating a halftone of a source image, the halftone including halftone pixels, the halftone pixels being suitable for containing halftone dots, each of the halftone pixels having a top boundary and a bottom boundary, the method comprising steps of:

(A) selecting glyphs corresponding to regions in the source image, the glyphs including halftone dots;

(B) selecting, from among the halftone pixels, a first halftone pixel and a second halftone pixel that share a pixel boundary;

(C) locating a first one of the halftone dots within the first halftone pixel so that the first halftone dot abuts the pixel boundary;

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(D) locating a second one of the halftone dots within the second halftone pixel so that the second halftone dot abuts the pixel boundary;

(E) positioning a third one of the halftone dots within a third one of the halftone pixels that is adjacent to the first halftone pixel by performing steps of:

- (1) if the first halftone dot abuts the top boundary of the first halftone pixel, positioning the third halftone dot to abut the bottom boundary of the third halftone pixel; and
- (2) if the first halftone dot abuts the bottom boundary of the first halftone pixel, positioning the third halftone dot to abut the top boundary of the third halftone pixel.

Claim 22 (new). The method of claim 21, wherein diagonally opposing corners of halftone pixels lie along a line at substantially a 45-degree angle to an axis of the halftone.

Claim 23 (new). The method of claim 21, wherein diagonally opposing corners of halftone pixels lie along a line at substantially a 38-degree angle to an axis of the halftone.